



# UNIVERSITY OF ILLINOIS EXTENSION

College of Agricultural, Consumer, and Environmental Sciences

## *Illinois Fruit and Vegetable News*

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*A newsletter for commercial growers of fruit and vegetable crops*

*"We are what we repeatedly do. Excellence, then, is not an act, but a habit." Aristotle*

Address any questions or comments regarding this newsletter to the individual authors listed after each article or to its editor, Rick Weinzierl, 217-244-2126, [weinzierl@illinois.edu](mailto:weinzierl@illinois.edu). The *Illinois Fruit and Vegetable News* is available on the web at: <http://ipm.illinois.edu/ifvn/>. To receive email notification of new postings of this newsletter, call or write Rick Weinzierl at the number or email address above.

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### *Upcoming Programs*

Check the Illinois SARE calendar for a full list of programs and links for registration.

<http://illinoissare.org/> and <http://illinoissare.org/calendar.php>

Also see the University of Illinois Extension Local Food Systems and Small Farms Team's web site at:

<http://web.extension.illinois.edu/smallfarm/> and their calendar of events at

<http://web.extension.illinois.edu/units/calendar.cfm?UnitID=629>.

- **GAPS: Food Safety on the Farm, February 16, 2015.** 9:00 a.m. – noon, Adams County Extension Office, Quincy, IL To register, see <https://web.extension.illinois.edu/registration/?RegistrationID=11647> or contact Mike Roegge at 217-223-8380 or [roeggem@illinois.edu](mailto:roeggem@illinois.edu).
- **Central Illinois Composting Symposium, February 24, 2015.** 9:00 a.m. – 3:00 p.m., at the Trutter Center at Lincoln Land Community College, Springfield, IL. For more information and to register, see [www.llcc.edu/green-center](http://www.llcc.edu/green-center) or call 217-786-4993.
- **Vandalia Vegetable Growers School, February 28, 2015.** 9:00 a.m. – 4:00 pm., Fayette County Farm Bureau, 1125 Sunset Dr., Vandalia, IL. No registration and no pre-registration required. For information and details, contact Mohammad Babadoost at 217-333-1523 or [babadoos@illinois.edu](mailto:babadoos@illinois.edu).
- **Fruit Tree Pruning Clinic, March 12, 2015.** 4:00 - 6:00 p.m., Dixon Springs Ag Center (meet at the greenhouse), 354 State Highway 145 North, Simpson, IL 62985. Hands-on workshop covering basic concepts of pruning, pruning equipment and maintenance, and peach and apple pruning. (Dress for outdoor work and bring pruning tools if you have them.) Registration fee is \$5.00, and pre-registration is required at <https://web.extension.illinois.edu/registration/?RegistrationID=11749> (or call 618-382-2662). For further program information contact Bronwyn Aly ([baly@illinois.edu](mailto:baly@illinois.edu); 618-382-2662) or Nathan Johanning ([njohann@illinois.edu](mailto:njohann@illinois.edu); 618-687-1727).
- **High Tunnel Workshop, March 19, 2015.** 10:00 a.m. - noon, Jackson County Extension Office, 402 Ava Rd., Murphysboro, IL 62966. Topics: high tunnel steaming, (with steaming demonstration), current overwintering crops in the high tunnel, and spring crops for the high tunnel and their management. No

registration fee, but please pre-register by calling the Jackson County Extension Office at 618-687-1727. For more information contact Nathan Johanning ([njohann@illinois.edu](mailto:njohann@illinois.edu) ; 618-687-1727).

- **Workshops on the Affordable Care Act (morning) and Succession Planning (afternoon), March 26, 2015.** Illinois Farm Bureau Building, Bloomington, IL. No fee, but registration is required; see [www.specialtygrowers.org](http://www.specialtygrowers.org) to register. For more information, contact Diane Handley at [dhandly@ilfb.org](mailto:dhandly@ilfb.org) or 309-557-2107.

**University of Illinois Small Farm Webinar Series:** A weekly educational series for the small farm community on important topics to advance local food production in Illinois. This series is aimed at providing small farm producers with a look at how leading practices in production, management, and marketing enable operations to improve profitability and sustainability. Webinars air live each Thursday at 1:00 – 2:30 p.m. and include a question and answer session. If you cannot attend, a link to the recorded webinars will be available to view at your convenience for all those who register. To register, see <http://go.illinois.edu/2015winterwebinars> or contact: Miki White, University of Illinois Extension, Small Farms/Local Foods Program Coordinator, Knox County; 309-342-5108 or [miki7047@illinois.edu](mailto:miki7047@illinois.edu). Remaining webinars include ...

<u>DATE</u>	<u>TOPIC</u>
Feb. 19, 2015	Understanding Insecticides
Feb. 26, 2015	Blueberry Production
Mar. 5, 2015	Hydroponics
Mar. 12, 2015	Effective Farmers Market Displays
Mar. 19, 2015	Veggie Compass Record-Keeping Software
Mar. 26, 2015	Variety Selection & Rootstocks for Establishing Apple Orchards

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**High Tunnel Webinar Series from University of Kentucky.** Covers season extension in high tunnel production systems; 6 webinars, each 75 minutes long, in February and March of 2015. For more information and to register, contact Miranda at 859-218-4384 or [miranda.hileman@uky.edu](mailto:miranda.hileman@uky.edu). All webinars will be broadcast from 5:30 p.m. – 6:45 p.m. CDT.

Topics ...

- February 17 — Season Extension Opportunities & EQIP Funding
- February 24 — Structure Options, Construction, Ventilation & Temperature Control
- March 3 — Organic Certification & Marketing High Tunnel Crops
- March 10 — Crop, Irrigation & Equipment Options
- March 17 — Insect, Weed & Disease Control
- March 24 — Producer Views & Series Wrap-up

## ***Regional Reports***

From southern Illinois ... Just as we are thinking that spring might be coming soon we have some rather cold weather on the way reminding us it is still indeed winter. Local orchards are working on pruning apples and some peaches. Some looking for early production already have tomato transplants started for high tunnel and greenhouse production.

Despite the cold temperatures things are still looking good in our demonstration high tunnel at the Jackson County Extension Office. The coldest temperatures we experienced were on January 8 where outside we reached 2° F and inside 4° F, with a couple of nights in the teens since then. Throughout all of those temperatures all of our crops (lettuce, spinach, Swiss chard, carrots) survived with no injury under a row cover in the tunnel. Additionally, we continue to selectively harvest the greens almost on a weekly basis. In another month there should be carrots ready to harvest as well. A fair number of sunny days have really pushed growth, and on one of our coldest very sunny days I had recorded a +45° temperature difference between inside and out of the tunnel – 25° outside and 70° inside (11:00 a.m., 2/5/15).

*Nathan Johanning (618-687-1727; [njohann@illinois.edu](mailto:njohann@illinois.edu))*

From western Illinois ... The good news is that winter is over half way completed. In about a month (March 20) spring will be here. I'm not sure what your feelings are, but it seemed like this winter has been exceptionally dreary. Did the sun shine more than 7 days in all of January? Can you tell that I'm eagerly awaiting those 60 degree temperatures and the smell of freshly worked dirt!

Seed catalogues arrived, orders have been placed and seed has arrived. Many high tunnel growers have started (or will soon start) transplants of tomatoes and other main crops. We're in the final stages of winter educational programs, so it's been a good time to catch up with individuals that we only see once or perhaps twice a year.

Hopefully you're trying some new varieties of fruits or vegetables this year. You've all heard the phrase "the only thing constant is change." We're in an industry that is constantly changing, yet also has its set of tradition. What I mean is that we all grow mostly traditional crops, but we're always trying to find one or two that somehow stand out and give us some niche or edge. When I think of the sweet corn hybrids or pumpkin varieties that were planted just 10 years ago and compare them to the ones grown today, there are no duplicates! We try to find those products that consumers will want this year; trying to be first can be a challenge though.

Aphids can be found in most high tunnel winter crops. Cold weather does not control aphids, only slows down their development. However, a few sunny 30 degree days really bring up the temperatures inside a tunnel, and the aphids will respond. It's always much easier to deal with a slight aphid population as opposed to one that has gone unchecked for weeks before control strategies are considered. Several options exist. If populations are small and only a few plants are affected, simply removing those plants can help. However, in most cases, it's likely that those populations are somewhat widespread before the problem is noticed. In that case, use of insecticides may be warranted if the product you're harvesting requires it be clean. There are a number of insecticides registered for use in leafy greens. In addition insecticidal soaps can be used, and there are organic insecticides registered. One of the problems noted in attempting to control aphids is coverage. If the product is a contact rather than a systemic, you must apply directly on the insect or to the bit of foliage it will crawl on to achieve control. Many leafy vegetables have irregular surfaces and can be low growing. Since aphids are found on the underside of the leaf, it can make contact challenging. For listings of insecticides labeled on specific crops, see the *2015 Midwest Vegetable Production Guide* at <http://www.btny.purdue.edu/Pubs/ID/ID-56/>.

How often do you soil-test your field or tunnel? A soil test should be completed at least every 3-4 years. It's the only way you can determine if your soil is providing the necessary nutrients that will allow your crop to achieve maximum potential. And it's not a hard process at all. Use a soil probe or dig a 7" hole and take a slice of soil the entire length and place in a bucket. Do that 4-5 times per sample area (3-5 acres) and combine into one sample. Costs to analyze samples and provide reports range from less than \$10.00 to around \$30.00, and the results will guide your fertility application for the next 3-4 years. If you need help interpreting the results, contact your local Extension office.

Mike Roegge (217-223-8380; [roeggem@illinois.edu](mailto:roeggem@illinois.edu))

## ***Fruit Production and Pest Management***

### ***Small Fruit and Tree Fruit Spray Guides***

The *2015 Midwest Small Fruit and Grape Spray Guide* is now available online at ...  
<https://ag.purdue.edu/hla/Hort/Documents/ID-169.pdf>.

The *2015 Midwest Tree Fruit Spray Guide* is now available at ...  
[http://www2.ca.uky.edu/agcollege/plantpathology/ext\\_files/PPFShtml/MwTreeFruitSprayGuideID92.pdf](http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/MwTreeFruitSprayGuideID92.pdf)

Printed copies of both of these publications are available for order from Publications Plus at the University of Illinois. See <http://www.PublicationsPlus.uiuc.edu>, call 1-800-345-6087, or write to 1917 South Wright Street, Champaign, IL 61820

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## ***Vegetable Production and Pest Management***

### ***Sanitizing Transplant Trays with Chlorine Bleach***

Most growers reuse transplant trays and containers for economic and environmental reasons. Trays and containers should be cleaned with sanitizing solutions after each use to prevent the spread of diseases. Sanitizing product labels need to be followed precisely depending on purpose and mode of use.

Chlorine bleach works best when trays are washed with soapy water, then dipped several times into a clean 10-percent solution. This step should be followed by covering the trays with a tarp to keep them wet overnight with the bleaching solution. Afterwards, the bleach solution should be washed from the trays with clean water followed by aeration to eliminate the chlorine and salts of chlorine. It is critical that the bleach solution remain below a pH of 6.8 and that a new solution be made up every 2 hours, or whenever it becomes dirty, whichever comes first. Organic matter deactivates bleach quickly.

*Kyle Cecil (309-342-5108; [cecil@illinois.edu](mailto:cecil@illinois.edu))*

### ***Preparing for Corn Earworm, 2015***

Corn earworms are often the most damaging insects in sweet corn in the Midwest. They overwinter in the pupal stage in the soil, but their survival rate is very low in most of the region. This winter has not been as cold as last winter, but local survival of corn earworms is not likely to be the cause of heavy moth flights in most parts of the state or region. Corn earworm manages to be a severe pest every year anyway because it migrates in from southern states on weather fronts every summer. In much of the region the period of first activity (and the first need to control them) can vary from June through August, depending on the time of their migration and the availability of sweet corn that is silking. Although control may be necessary in one portion of the region at a particular time, it may be unnecessary in many other locations. Consequently, it really is essential to establish a monitoring program to determine spray needs. Unfortunately, scouting for foliar damage or larvae on the surface of plants is not an option. Corn earworm moths lay their eggs singly on silks, and larvae move down the silk channel immediately after they hatch from the eggs (and hatching can occur in as little as 2 ½ days during hot weather). On corn, larvae do not feed on any exposed parts of the plant (leaves, husks, etc.), so the only practical way to kill them (short of having planted BT sweet corn, which does not provide 100 percent control) is with a contact insecticide applied to the silks. Larvae crawl across the residues on the silks, and the insecticide is taken up through the cuticle.



Left: Corn earworm larva. Right: Hartstack trap.



Corn earworm moth (Kansas Department of Agriculture).

Effective monitoring programs depend on the use of pheromone-baited traps that catch male corn earworm moths and are used as indicators that adults of both genders are present and eggs are being laid. Previously we have recommended using either a wire Hartstack trap (pictured above) or a nylon version of the same general design marketed by Scentry and several regional distributors. We've long known that paper sticky traps are ineffective at monitoring corn earworm moths, and about a decade ago research indicated that the Scentry nylon cone traps may not work well enough. Results from monitoring work done in 2006 showed that the nylon traps also may fail to detect light but still significant flights when the wire Hartstack traps do catch moths. Consequently, I now recommend that all sweet corn and seed corn producers use the wire Hartstack trap. (Data to support this recommendation came from a regional monitoring effort coordinated by Bill Hutchison of the University of Minnesota and conducted by several entomologists and horticulturists who participate in the Great Lakes Vegetable Workers Group.) Traps should be baited with Hercon "zealures," and the lures need to be replaced every 2 weeks. Earworm control is necessary when moth flight is ongoing and fresh silks are present. If traps are catching more than a few moths (3 to 10 per trap per night) when silking begins, sprays should be applied within 2 days after first silk – insecticide residues must be on the silks to kill larvae immediately after they hatch from eggs and before they enter the silk channel. If the only silking corn in your area is your field, the threshold for treating should be revised down to 1 moth per trap per night ... in your traps or those operated by your neighbors.

A Midwest supplier of the Hartstack trap for earworms is Bob Poppe, Route 1, Box 33, Lexington, IL, 61753 (309-723-3201). I suggest that you buy an extra top cylinder for each trap to make handling more efficient. Lures are available from Great Lakes IPM (10220 Church Road NE, Vestaburg, MI 48891; 989-268-5693; 989-268-5911; 800-235-0285; FAX: 989-268-5311). The wire Hartstack trap is not cheap ... think in the \$300 range plus shipping, and think higher numbers if the traps must be shipped a long way. But before you let the price tag make you balk, consider ...

- These traps will last for many years (I have a couple that are over 30 years old) ... as long as you don't run over them with tractors or other vehicles.
- Along with a few dollars for lures every year and daily monitoring of moth counts, they provide you with guidance that can keep you from spending thousands of dollars unnecessarily or losing thousands of dollars' worth of sweet corn sales. If you spray 10 acres of sweet corn even twice a week for 3 weeks before earworms are actually present and require control, that's 6 applications at (conservatively) \$20.00 per acre for each application if you use something that's effective ... multiplied by 10 acres, that's \$1,200 (plus the loss of time not spent doing something more necessary). Multiply that by a 20-year life span for the trap, and the total exceeds \$24,000. I think that pays for the trap and the lures. Viewed in a different way, if high trap counts lead you to spray more often in order to get the control you really need, you market more corn. For a fresh-market producer who sells sweet corn at \$4.00 per dozen, a (low) yield of 1,200 dozen per acre is worth \$4,800. Preventing a 5 percent loss by spraying extra when needed saves \$240 per acre in sales. Multiply that by 10 acres and 20 years, and the total reaches \$48,000 ... that, plus keeping your customers from complaining about wormy corn, certainly pays for the cost of a trap and a package of lures every year.

### **Insecticide and "trait" choices for corn earworm control**

First, insecticides ...

- The goal of insecticide applications in sweet corn is to put a residue on fresh silks that kills larvae before they can move from the egg on the silk into the tip of the ear. (If sprays kill some adults, that's a benefit, but that's NOT what makes an effective spray program, especially for growers with smaller fields and diverse plantings.)

This means that sprays must be applied repeatedly as the silks elongate. Although the residual activity of many insecticides is several days, newly emerged portions of silks near the ear tip were not exposed to the sprays applied a couple of days earlier. This is why sprays are recommended on 2- to 3-day intervals as long as silk growth continues. If traps are catching just few moths and temperatures are moderate, a 3-day spray interval can be adequate. If traps are catching 30 or more moths per night and temperatures are in the 90s, spraying every 2 days will be necessary to produce corn with very few damaged ears. Sprays should begin within 2 days after silks have begun to emerge if moths were flying when silks appeared.

- At least some of the corn earworm populations that migrate into the region are resistant to pyrethroids (Baythroid, Brigade, Hero, Mustang Max, Warrior, and their generic versions). Alternatives to pyrethroids – such as Belt, Coragen, Entrust (for organic growers), and Radiant – are not quite as effective as the pyrethroids used to be before resistance development. Where markets demand corn that is nearly worm-free, relying on a pyrethroid or an alternative alone is not likely to give adequate control when moth flights are high. Combinations of a pyrethroid plus one of these alternatives or a pyrethroid plus Lannate are likely to give the best results. If you take this approach and tank-mix two different kinds of insecticides, use each at their label rates (often the middle of range listed on each product's label). Making timely applications on the right interval (2 or 3 days) is FAR more valuable than using the highest possible rates. A pre-mix of the active ingredients in Warrior (lambda-cyhalothrin) and Coragen (chlorantraniliprole) is sold under the trade name Besiege. It provides an alternative to tank-mixing two different chemicals.

What about Bt sweet corn varieties?

- From a grower's perspective, there are three different categories of Bt sweet corn varieties on the market or soon to come to market. (1) The Attribute series sweet corns produce one kind of Bt toxin. It is very effective against European corn borer and corn earworms. The "problem" is that only 3 of 4 kernels on ears in Attribute series Bt sweet corn fields produce the toxin (a result of the heterozygous nature of the genetics of the variety and random recombination in the offspring – the kernel, because the endosperm is F<sub>1</sub> tissue). Additionally, the Bt toxin in the Attribute series is not very effective against black cutworm or western bean cutworm (and not at all effective against rootworms or sap beetles). (2) The Seminis "Performance" series of Bt sweet corn varieties produce two toxins that kill Lepidopteran larvae; they also have genes for corn rootworm larval resistance and resistance to Roundup. The second Bt toxin in these varieties provides much greater control of black cutworm, fall armyworm, and western bean cutworm (as well as European corn borer and corn earworm). However, only 3 of 4 kernels on ears in Performance series Bt sweet corn fields produce the toxin (again, a result of the heterozygous nature of the genetics of the variety and the fact that the genes for the two toxins are linked and so they move together – not independently – in the recombination of genes in the offspring – the kernel). (3) A new "Attribute II" series of sweet corn varieties is under development by Syngenta. Varieties that were available for sale in 2014 were not the ones that most direct-market growers choose to plant. In the Attribute II series, genes code the production of two very different toxins that kill Lepidopteran larvae (cutworms, armyworms, European corn borer, and corn earworm). These genes are not linked, and as a result, 15 of 16 kernels on ears in Attribute II series Bt sweet corn fields produce one or both toxins. The Attribute II hybrids that I and others have tested have been far more effective against corn rootworms than any other Bt hybrids available to date.
- Do Bt sweet corn varieties still need to be treated with insecticides? Yes. Although the Attribute II series will suffer less damage when untreated than other existing Bt varieties, the Attribute II hybrids that will be best suited to direct-market producers are not yet available except as small samples. The original Attribute series and the Performance series varieties must be treated when corn earworm moth flights are heavy or if western bean cutworm is present. The jury is still out on the characteristics of a reduced spray program that would adequately protect these varieties. In varieties with long silk channels, early sprays might be skipped (because larvae would ingest Bt toxins as they feed on silks while moving toward kernels). Bt concentrations decline somewhat in silks after pollination, and as ears elongate and kernels have less cover, sprays may be more necessary. The point for now is simple ... do be prepared to use insecticides on Bt sweet corn if it must be worm-free for your markets.

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